U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE

# HEARING CHARTER

## *Inspector General Report on NOAA Weather Satellites*

May 11, 2006
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

**Purpose:**

On May 11, 2006 at 10:00 a.m., the House Science Committee will hold a hearing about a report by the Department of Commerce Inspector General (IG), "Poor Management Oversight and Ineffective Incentives Leave NPOESS Program Well Over Budget and Behind Schedule." The IG report will be officially released at the hearing, which will be the first public discussion of the report's conclusions. (An embargoed copy of the Executive Summary of the report is attached as Appendix I.)

The National Polar-orbiting Operational Environmental Satellite System (NPOESS) satellites are under development and are designed to become the nation's key weather satellites, replacing the current generation of both civilian and military weather satellites as they reach the end of their useful lives. Yet the program is more than 25 percent or as much as $3 billion over budget and as many as three years behind schedule, creating a possible gap in weather satellite coverage (if current satellites fail before new ones can be launched).

The IG report examines how the NPOESS program got so off track and has two primary findings and related recommendations. The first finding is that the top officials at the agencies responsible for NPOESS did not exercise sufficient oversight and did not seek sufficient information from sources who were independent of the NPOESS program. The second is that the way the contract for NPOESS is written and the way it was implemented enabled the contractor to receive sizable award fees even when the program was not performing well.

The agencies in charge of NPOESS are the National Oceanic and Atmospheric Administration (NOAA), the Department of Defense (DOD), and the National Aeronautics and Space Administration (NASA). The IG report only examines actions by NOAA (which is the only NPOESS agency within the Commerce Department IG's jurisdiction) NOAA is responsible for overall program management of NPOESS and, during most of the period under review, a NOAA employee was the day-to-day official in charge of the NPOESS program.

The IG report includes comments from NOAA and the IG's responses to those comments. Under Department rules, NOAA also must, within 60 days, develop a plan to remedy the concerns raised by the IG. That period may be extended because the NPOESS program is already undergoing a top-to-bottom review required by law because of the cost overruns. This review, known as a "Nunn-McCurdy review," is described in greater detail below.

**Witnesses:**

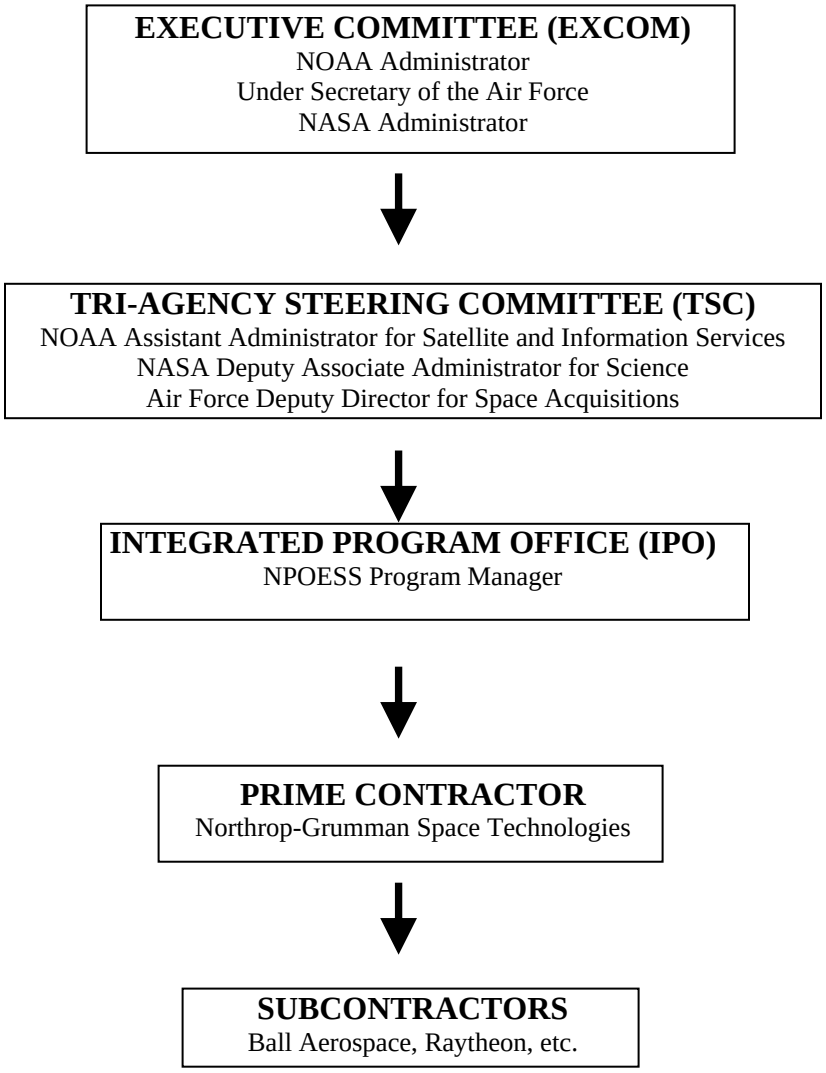
**Mr. Johnnie E. Frazier**, Inspector General, U.S. Department of Commerce
**Vice Admiral Conrad C. Lautenbacher (ret.)**, Administrator, National Oceanic and Atmospheric Administration

**Background on NPOESS:**

**What is NPOESS?**

The federal government has traditionally launched separate weather satellites to serve military and civilian needs. NPOESS, begun in 1994, is the first joint civilian/military weather satellite program. NOAA and DOD together share the cost of developing the NPOESS satellites. NASA also supports the program primarily by overseeing the development of a small satellite, known as the NPP (for NPOESS Preparatory Project), designed to test some of the advanced sensors the NPOESS satellites will later carry, reducing the risk that these sensors will not work as expected.

**Figure 1. NPOESS Program's Management Structure.**



The NPOESS satellites are designed to fly in an orbit around the Earth's poles. They complement other weather satellites that orbit the Earth at the equator (so-called geostationary satellites because they orbit at the same speed as the Earth rotates, and so appear to hover above a fixed position on the ground). As polar-orbiting satellites circle the Earth, they provide global coverage of weather and climate conditions.

NPOESS satellites are being built to carry instruments, or sensors, to measure a number of meteorological features important to developing three- to seven-day weather forecasts and for predicting severe weather, such as hurricanes. For example, some sensors are being developed to measure ocean winds to help predict El Nino and aid the military's operation of aircraft carriers. Others will measure soil moisture, which is important to military planning as well as agriculture and water resource managers. Aerosol detectors will help predict such aviation hazards as volcanic ash while helping the military predict whether it will be able to accurately spot its targets. Ocean-color sensors can track fish populations and ocean-borne pollution while helping the military sweep for mines. And as the events of the 2005 hurricane season showed, improved accurate forecasts can help better predict hurricane paths, allowing emergency managers to target their efforts and preventing unnecessary coastal evacuations that can cost up to $1 million a mile.

**Past Problems with NPOESS**

NPOESS has a history of budget and technical problems.[1] When first conceived in 1994, NPOESS was expected to cost $6.5 billion, a savings of $1.8 billion compared to the cost of separately developing new satellite systems for military and civilian use. The NPP test satellite was originally expected to be ready for launch in May 2006, while the first operational NPOESS, the C-1 satellite, was to be available for launch in June 2008.

The government and contractors drew up a new cost estimate and schedule for NPOESS (known as a "rebaselining") early in 2004 to take into account funding cutbacks in FY 2003 (by Congress) and FY 2004 (by the Administration). Under the new baseline, the total expected cost of the program rose by $900 million (to $7.4 billion) and the schedule was delayed by several months: NPP was to be launched in October 2006 and NPOESS C-1 was to be launched in February 2009.

In November 2004, major technical and engineering problems emerged with one of the key sensors, known as VIIRS (pronounced like "veers," the instrument is a type of infrared camera used to collect images of clouds and to probe sea surface temperature, an important aspect of hurricane prediction). In response to the problems with the sensor, Raytheon, the subcontractor building VIIRS, fired its entire technical team working on the instrument and put new staff on the task. By March 2005, the problems with VIIRS had become so severe that Northrop-Grumman Space Technologies, the prime contractor, notified the government it would not be able to deliver NPOESS on cost or schedule. That notification triggered a series of reviews by NPOESS officials.

[1] See the hearing by the Science Committee's Subcommittee on Environment, Technology and Standards in July 2003, and by the Full Science Committee on November 16, 2005, both available at http://www.house.gov/science/.

At the Full Science Committee's November 16, 2005 hearing, the Committee heard from the Air Force, NOAA, the prime contractor, and the Government Accountability Office (GAO) about the options under consideration to deal with the cost overruns and schedule delays. NOAA and the Air Force testified that the NPOESS program acquisition costs would increase by 15 percent over the program's most recent cost estimate and would likely result in a delay of at least two years. Committee Members pressed repeatedly for NOAA and DOD to justify their decision not to seek additional funding in fiscal years 2006 and 2007, even though the prime contractor on the program testified that increased funds in those years would significantly reduce life cycle costs, help resolve looming technical problems sooner, decrease the risk of a gap in weather satellite coverage, and increase the chances that the NPOESS development program overall will be successful. NOAA and the Air Force told the Committee they believed that no new funds were needed, at least in the short run, because slowed work on some sensors would free up funds to continue work on other sensors.

About two months after the Committee's hearing, cost estimates for the NPOESS program rose to more than 25 percent above the program baseline estimate, triggering a Nunn-McCurdy certification review described in the next section.

**Nunn-McCurdy Review**

The NPOESS contract follows DOD acquisition procedures. As a result, it is subject to the Nunn-McCurdy provisions of the DOD acquisition law (10 U.S.C. 2433). Under the Nunn-McCurdy law, if a program's costs increase by more than 25 percent, the Secretary of Defense (or the Secretary of the appropriate branch of the military) must certify the program in a period of time specified under the law or no additional funds can be obligated for the program. Certification requires a written justification that:

(1) The program is essential to the national security;
(2) There is no alternative that can provide equal capability at less cost;
(3) New estimates of costs have been developed and are reasonable; and
(4) Management structure is adequate to control costs.

On January 11, 2006, the Secretary of the Air Force notified Congress that the NPOESS program would exceed the 25 percent Nunn-McCurdy notification threshold (meaning that acquisition costs would increase by at least $1.85 billion over the program's most recent cost estimate of $7.4 billion). This triggered a formal certification process that effectively superseded any previous independent reviews as well as pending program direction decisions about mitigating cost overruns and schedule delays. The decision on whether to certify the NPOESS program is due no later than June 5, 2006.

If the Secretary decides the program does not meet any or all of the four certification criteria and or if the required certification is not provided to Congress by the due date, no more DOD funds can be obligated for a major contract under the program (essentially terminating the program). If the Secretary does decide to certify a program, that certification is generally contingent on changes made to technical requirements (e.g., sensor design), cost, schedule, and/or management structure to ensure that costs do not continue to rise as the program moves forward.

To address each of the four certification criteria for the NPOESS program, DOD established four Independent Program Teams, each assigned to look at one of the criteria. Each team consists of representatives of each of the three agencies responsible for NPOESS and other experts on both satellite acquisition and on the technical capabilities of satellites. The Nunn-McCurdy certification process for NPOESS represents the first time an interagency program has undergone a Nunn-McCurdy review so this review has raised some unique concerns (including interagency representation on the teams). In December 2005, key members of the House Science and Armed Services Committees sent a letter to the DOD and Air Force officials responsible for the Nunn-McCurdy process urging, among other things, full coordination of this process with NOAA and NASA. The Science Committee sent the letter, in part, because of concerns that a Nunn-McCurdy certification could recommend changes that would be detrimental to NOAA's satellite needs while still addressing DOD's needs.

For 2006, the NPOESS program office (known as the Integrated Program Office, or IPO) and Northrop Grumman (the prime contractor) put together an interim program plan to continue building key components of the program pending a Nunn-McCurdy decision. Thus far the program is operating within the cost estimates and schedule set for this year.

**Major Topics of Inspector General's Report:**

**1. Executive Committee (EXCOM) oversight of NPOESS**

IG Finding: Despite increasing evidence of cost and schedule problems with VIIRS (the key NPOESS sensor), the EXCOM did not challenge the IPO's optimistic assessments that development of VIIRS would not delay launch dates for NPOESS. Also, the EXCOM met infrequently – just twice in 18 months – during the critical period when VIIRS problems were worsening, resulting in lost opportunities to investigate program status and make necessary program management decisions.

IG Recommendation: The NOAA Administrator should ensure that the EXCOM receives regular, independent evaluations of NPOESS to enable ongoing, active oversight of the program.

NOAA and IG Responses: In its written response to the IG report, NOAA argued that it had exercised oversight of the program through private discussions as well as EXCOM meetings. It also said that it has already taken action to institute independent reviews. In the report, the IG countered that private meetings cannot substitute for formal oversight. The IG said the EXCOM needs to have a formal, documented means to oversee the NPOESS program, in part because that enables greater continuity when program officials change. Also, the IG argued that any private meetings or reviews apparently did not result in any concrete actions to keep the program on track. Finally, the IG argued that NOAA needs to establish a clear process to get regular, independent evaluations beyond the ad hoc independent reviews that have already been undertaken to determine the current status of the program.

Current Status of IPO: There have been significant management changes at the IPO and the prime contractor in the past few months, especially with regard to personnel. The NPOESS program director (that is, the head of the IPO) during most of the period covered by the IG report

(a NOAA employee) has resigned, apparently under pressure, and the Northrop Grumman program director at the time many of the problems with VIIRS occurred no longer works on the program. In addition, the EXCOM has set up a new structure to centralize the responsibilities that reside below the EXCOM level. A single Program Executive Officer (PEO) has been inserted at a level between the EXCOM and the IPO, at least temporarily. The PEO structure is common in DOD acquisition programs. The current PEO is a Brigadier General in the Air Force with extensive experience in major procurements. The current IPO program director is an Air Force Colonel who is reporting to NOAA in his IPO role.

Remaining Issues with IPO: This new structure means there is a lot of Air Force influence at the top levels of the NPOESS program and raises concerns about whether NOAA and NASA priorities will still receive adequate attention. Also, NOAA has not yet formally agreed to adopt the new PEO structure for NPOESS program management, pending the outcome of the Nunn-McCurdy process. Finally, NOAA has not said whether the EXCOM will meet more frequently or take a more hands-on approach to oversight.

Remaining Issues with Independent Reviews: It is not clear whether the kinds of reviews NOAA has now put in place are sufficiently independent to satisfy the IG. On the other hand, while independent reviews are valuable and can provide new insights (and might have provided a check on IPO optimism earlier in the program), they also require time and money. Some satellite industry officials think that annual independent reviews of the NPOESS program overall would be useful, while others think independent reviews just at certain milestone events (such as technical reviews during critical tests of important sensors) would be more effective. Others think that with the Nunn-McCurdy review NPOESS has received sufficient independent analysis and does not require more independent review in the future.

**2. Contractor Award and Incentive Fee Structure and Management**

IG Finding: Under the NPOESS contract, the prime contractor is eligible to receive award and incentive fees to reward performance. These fees are over and above reimbursement for the actual costs of carrying out contract tasks. Under the NPOESS contract, Northrop Grumman can earn award and incentive fees equal to 20 percent of the program's actual costs. The IG concluded that the 20 percent award and incentive fee level is higher than what is allowed on almost all other DOD contracts. Moreover, Northrop Grumman received most of the award and incentive fees for which it was eligible even though the program was behind schedule and over cost. The award and incentive fees were determined by the IPO director, and the fees were often in excess of what a fee advisory board had recommended. Specifically, Northrop Grumman has received 83 percent of the award and incentive fees it could have earned to date even though NPOESS is as much as $3 billion over budget and 17 months behind schedule. Even during a period in which the IPO rated the contractor's performance as "unsatisfactory," Northrop Grumman earned almost half of the possible award and incentive fee. (An overview of DOD contract award fees is in Appendix II.)

IG Recommendations: The NOAA Administrator should ensure that the EXCOM revises the award and fee plan. The new fee plan should deny award and incentive fees when performance is not satisfactory. The IG also recommended reviewing the rollover provisions of the current

fee structure. In the current fee structure, award and incentive fee determinations are made every six months, but award and incentive fees not earned in one six-month period are not always lost; instead, in some cases, those lost fees are simply added to (rolled over into) the amount of award fees available in the next six-month period. The IG also recommended that the IPO director not be the person who determines when the award and incentive fees are earned. DOD programs generally do not allow the program manager to determine the fees because the program manager has an inherent interest in claiming that progress is being made in the program and that progress is reflected in the award and incentive fees.

NOAA and IG Responses: NOAA argued in its written response that the IG report does not fully characterize the award and incentive fee structure, but NOAA did not elaborate. NOAA also argued that the contractor will lose all award and incentive fee payments if it does not deliver a working satellite. Finally, NOAA pointed out that NPOESS is operated under a DOD contract. In the report, the IG countered that NOAA's comments did not deal with the heart of the IG's concerns about excessive contract fees. The IG also pointed out that while NPOESS operates under a DOD contract, NOAA, through the EXCOM, has a role in developing and implementing the contract. Moreover, the IG pointed out that the person managing the contract and determining award and incentive fees (the IPO director) was a NOAA employee.

Current Status: The fee determining official for NPOESS is now the PEO rather than the IPO director, although it is not clear if this change will satisfy the IG. (The IG said in the report that the PEO would be a solution only if the PEO "is not directly responsible for managing the NPOESS program.") Related to the contract structure, in December 2005, GAO issued a report criticizing DOD award fee policies department-wide. Many of GAO's criticisms of DOD were similar to the issues raised by the IG with respect to NPOESS. In response to the GAO report, in March 2006, DOD instituted a new award fee policy that addresses GAO's concerns about providing an incentive for critical tasks, linking award fee more closely to contractor performance, and placing limitations on rollover. This new DOD policy does not automatically apply to the NPOESS contract but the Nunn-McCurdy process could ultimately result in changes to the award fee plan for NPOESS, some of which may address the issues raised by the IG.

Remaining Issues: If DOD certifies NPOESS, the contract will have to be renegotiated, providing an opportunity to restructure the award fee structure. It remains to be seen how much NOAA can influence a new award fee structure because the Air Force is the lead on the NPOESS contract and procurement issues. However, NOAA does have an equal voice on the EXCOM and the EXCOM must approve the final renegotiated contract.

**Other NOAA Satellite Programs:**

NPOESS is not the only major satellite system vital to NOAA's ability to forecast weather and climate conditions. NOAA also relies heavily on geostationary satellites, which observe a fixed position on the Earth and fly in a higher orbit than polar satellites. Geostationary satellites are important for assessing current weather conditions and providing forecasts out to two days. NOAA plans to let the prime contract for its next generation of geostationary satellites, known as GOES-R, in Fiscal Year 2007 and is already well into the planning for GOES-R. NOAA is the sole agency funding GOES-R. The IG has stated that it expects NOAA to take the

recommendations from the NPOESS report into consideration for future satellite procurements such as GOES-R.

**Witness Questions:**

The witnesses were asked to address the following questions in their testimony.

**Mr. Johnnie E. Frazier**, Inspector General, U.S. Department of Commerce

1. Please outline the major findings and recommendations of your report, "Poor Management and Ineffective Incentives Leave NPOESS Program Well Over Budget and Behind Schedule."
2. What types of actions could NOAA take to satisfy the recommendations of your report? Please be as specific as possible.

**Vice Admiral Conrad C. Lautenbacher (ret.)**, Administrator, National Oceanic and Atmospheric Administration

1. Do you agree with the following recommendations from the Department of Commerce Inspector General Report, "Poor Management and Ineffective Incentives Leave NPOESS Program Well Over Budget and Behind Schedule?"
    a. Work to ensure that the EXCOM obtains regular, independent evaluations of the status of the NPOESS program (including progress on high-risk tasks and tasks on the program's critical path and impacts of any problems).
    b. Work to ensure that the EXCOM reviews and considers changes to the structure of the Award Fee Plan for NPOESS, including (1) whether the Award Fee Plan adequately incentivizes high-risk tasks and/or tasks on the critical path; (2) whether the contractor should receive any award fee during a period for which their overall performance is unsatisfactory; (3) whether the award fee pool (up to 20 percent of the contract's total estimated costs) is excessive and (4) whether award fee "rollover" opportunities for NPOESS are appropriate.
    c. Work to ensure that the responsibility for determining the award fee for NPOESS is assigned to an official who does not have responsibility for day-to-day program management.

2. What specific steps have you taken and will you take to address each of the IG's recommendations listed below? How will the IG's recommendations factor into the Nunn-McCurdy certification review?
    a. Work to ensure that the EXCOM obtains regular, independent evaluations of the status of the NPOESS program (including progress on high-risk tasks and tasks on the program's critical path and impacts of any problems).
    b. Work to ensure that the EXCOM reviews and considers changes to the structure of the Award Fee Plan for NPOESS, including (1) whether the Award Fee Plan adequately incentivizes high-risk tasks and/or tasks on the critical path; (2) whether the contractor should receive any award fee during a period for which their overall performance is unsatisfactory; (3) whether the award fee pool (up to 20 percent of the contract's total estimated costs) is excessive and (4) whether award fee "rollover" opportunities for NPOESS are appropriate.

c. Work to ensure that the responsibility for determining the award fee for NPOESS is assigned to an official who does not have responsibility for day-to-day program management.

3. What have you done and what will you do to address the issues listed below and other lessons learned from NPOESS in managing the acquisition of future satellites, including GOES-R?
    a. Timely communication to NOAA management regarding risks and problems in the program;
    b. Regular, independent evaluations of the status of the program (including technical, cost and schedule performance); and
    c. Reasonable award fee structure and appropriate administration of award fee (e.g. an independent fee determining official).

## Appendix II: NPOESS Award and Incentive Fee Plan

The NPOESS award fee has three main parts:

Base Fee
A base fee of 2 percent of total estimated costs is provided to the contractor automatically each billing period. The total base fee is currently $57 million over the lifetime of the NPOESS contract (10 years). Essentially, this is the contractor's minimum profit on the NPOESS program.

Award Fee
An award fee pool of 13 percent of total estimated cost is available. The total award fee pool is currently $369 million over 10 years. Each award fee period (approximately every six months), an award fee determining board makes recommendations on what percentage of available award fee the contractor should receive. The recommendations are made based on the board's review of criteria for how well the contractor has met cost, schedule, and performance goals for that period. Then, the fee determining official weighs the board's recommendations and makes a final decision on how much fee the contractor receives for that period.

Mission Success Fee (Incentive Fee)
A mission success fee pool of 5 percent of total estimated costs is available. The total mission success fee pool is currently $137 million over 10 years. The mission success fee is tied to successful completion of seven critical events (critical design review of the program, NPP sensors complete and delivered, NPP ground readiness, processing of NPP data, NPOESS ground readiness, processing NPOESS data, interim operational capability). To date, none of the critical events has occurred.

Fees are At-Risk
Finally, if the NPOESS satellites fail to operate properly once they are in orbit, the contractor must pay back to the government all of the award and mission success fee it received.

GAO's December 19, 2005 report "Defense Acquisitions: DOD has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcomes" (GAO-06-66), provides helpful background about DOD contracts. The relevant portion of the GAO Report is attached: